Rhodora

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CONTRIBUTION TO THE FUNGUS FLORA OF NORTHEASTERN NORTH AMERICA. V.[1]

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Since our last report on the higher fungi of the northeast, continued field work and the laboratory study of specimens have resulted in additional records of fruiting as well as the discovery of more new species. Some interesting variations of well known species have been found also. The following constitute a miscellaneous assemblage which does not belong to monographic work currently in progress.

As previously, the data on agarics are from the studies of the senior author, while the junior author has contributed the information on ascomycetes. The colors mentioned within quotation marks are from Ridgway, R. 1912. Color Standards and Color Nomenclature. Washington, D.C. Unless stated otherwise, the collections cited are deposited in the Herbarium of the University of Massachusetts, Amherst (MASS).

BASIDIOMYCETES

Armillaria decorosa (Pk.) Smith & Walters, Mycologia **39:** 622. 1947.

Material examined. **Vermont:** *Bigelow* 13940, Bingham Falls, near Stowe, Lamoille Co., 9 Sept 1964. Solitary or scattered, on hardwood log.

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[1]I. Rhodora **62:** 186-198. 1960. II. Rhodora **64:** 126-137. 1962. III. Rhodora **65:** 289-309. 1963. IV. Rhodora **68:** 175-191. 1966. Contribution from the Department of Botany, University of Massachusetts, Amherst.

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This rare species is described and illustrated by Smith and Walters (1947), and by Farlow and Burt (1929, as a *Tricholoma*). The following provides additional information on microscopic characters.

Spores 5-6 × 3-3.5 μ, elliptic, smooth, amyloid. Basidia 15.5-21 × 5.5-6 μ, 4-spored. Cystidia not differentiated. Pileus cutis brown in KOH, pigment in cell contents and in thickened smooth walls, hyphae cylindric or composed of chains of ± sausage-shaped cells, 5.5-19 μ in diameter, 31-55 μ long, trama pale brown in KOH, hyphae cylindric to inflated, 4-11.5 μ in diameter, walls thin or slightly thickened, hyaline or faintly brown. Hymenophoral trama regular to subparallel, hyaline in KOH, hyphae cylindric or slightly inflated, 4-9 μ in diameter. Clamp connections present.

As Smith and Walters have indicated, *A. decorosa* seems closely related to the lignicolous species of *Cystoderma*. I did not find the sphaerocysts typical of *Cystoderma* in the Vermont carpophores, but certainly the sausage-shaped cells of the cutis hyphae suggest a possible precursor of the cuticular sphaerocysts.

Armillaria viscidipes Peck, New York State Mus. Rep. **44:** 16. 1891. Plate 1406.

Pileus 6.5-13.5 cm broad, broadly convex to plane, broadly subumbonate at times, margin incurved at first, finally upturned in age, even, surface dry when collected but probably viscid in wet weather, somewhat shining, innately fibrillose in places or diffracted scaly, in age cracked or pitted at times, color a sordid buff; context thick, white, tough, odor pungent, taste mild.

Lamellae adnexed at first becoming rounded or slightly sinuate, narrow to moderately broad (up to 1 cm), close or crowded, forked at times, whitish becoming cream-colored, dingy in age, edges even, slightly undulate.

Stipe 5-11 cm long, apex 1.5-3.4 cm thick, equal or base ventricose (up to 4 cm thick), abruptly tapered in substrate, solid (white within and continuous with pileus flesh), apex white, fibrillose to somewhat scabrous (about ¼ of stipe length), partial veil thin and soon collapsed, central portion and base viscid, brownish stained when gluten dried, rather shiny and somewhat zoned or appressed scaly.

Spores 6-8 × 4-5.5 μ, elliptic to broadly elliptic, smooth, not amyloid, spore deposit white. Basidia 31-44 × 6-8 μ, 4-spored. Cystidia not differentiated. Pileus surface with very thin gelatinous pellicle, cutis thin, hyphae mostly cylindric, (2-)4-12.5 μ in diameter; tramal hyphae cylindric to inflated, 7.5-18.5(-21.5) μ in diameter, walls often somewhat thickened. Hymenophoral trama of subparallel hyphae, slightly

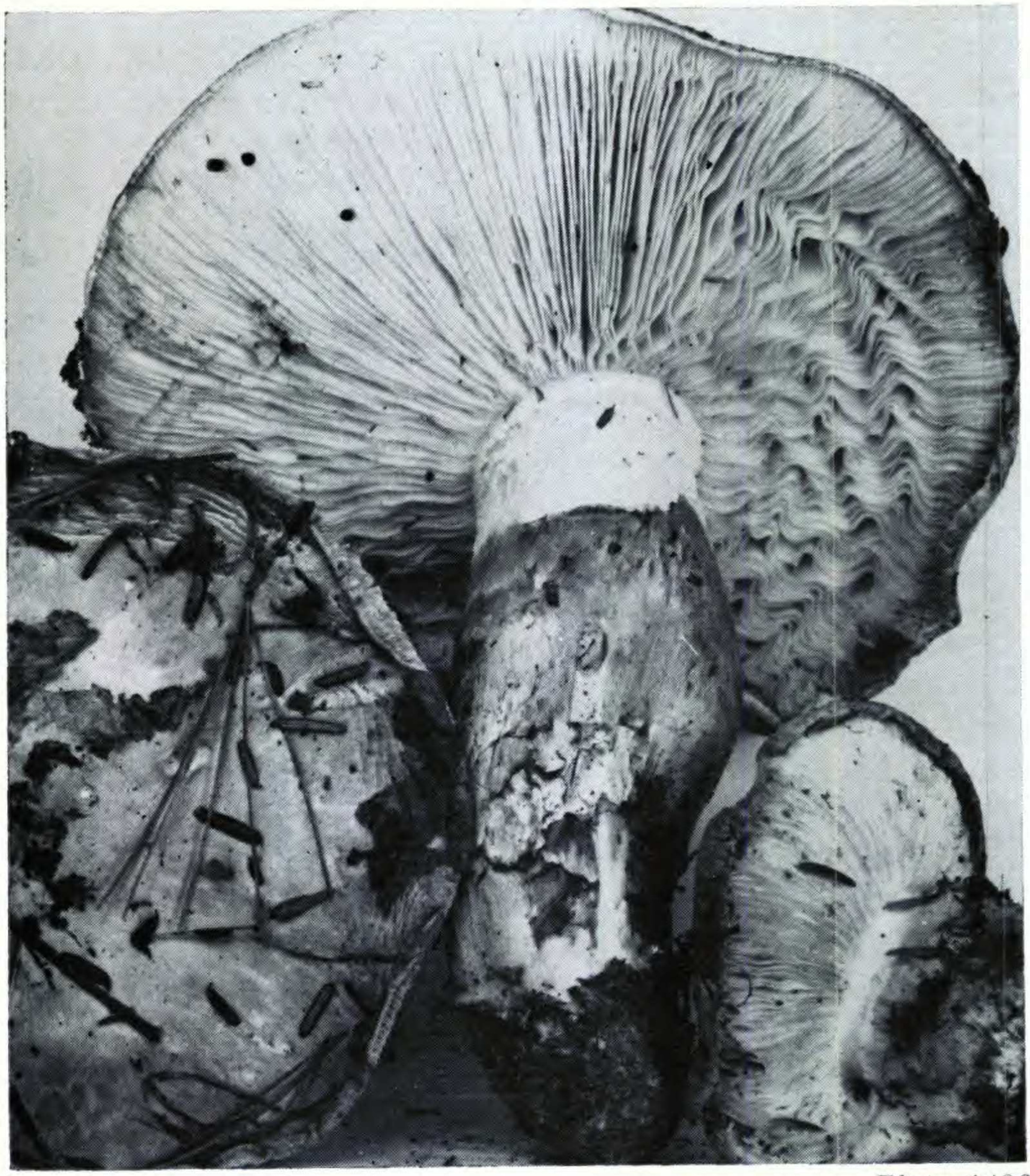


Plate 1406

Plate 1406. *Armillaria viscidipes* Peck. × 1.

diverging near subhymenium, hyphae cylindric, 2.5-5(-8.5) μ in diameter. Clamp connections absent. Refractive hyphae present but rare.

Gregarious, on mossy hummock near stream through open hemlock stand.

Material examined. **Massachusetts:** *Bigelow* 14999, Conway, Franklin Co., 31 Oct 1966; 15590, same locality, 16 Oct 1968.

This *Armillaria* also appears to be rare according to the records in the literature. Besides the orginal description based on specimens found in New York, the only other

records from the east appear to be those of Hesler (1945). He collected *A. viscidipes* in Kentucky and Tennessee. Kauffman (1921, 1925) has reported fruitings in Colorado and Oregon.

Cystoderma amianthinum var. **sublongisporum** Singer, Pap. Mich. Acad. Sci., Arts, Lett. **30:** 112. 1945.

Material examined. **Massachusetts:** *Bigelow* 7883, Mt. Toby, Sunderland, Franklin Co., 4 Oct 1958; 7963, same locality, 2 Nov 1958; 10035, Womens Club State Forest, New Salem, Franklin Co., 7 Nov 1961. **New Hampshire:** 12519, Oliverian Brook trail, White Mountains Nat. Forest, 7 Sept 1963. **Vermont:** 13673, top of Mt. Mansfield, 29 Aug 1964; 13812, 13813, Ranch Brook trail, near Stowe, Lamoille Co., 1 Sept 1964; 13941, Bingham Falls, near Stowe, 9 Sept 1964; 14011, same locality, 11 Sept 1964; 14360, same locality, 3 Oct 1964. **Quebec:** 4783, 4784, 4785, Provincial Nursery, near Berthierville, 9 Oct 1956; 4861, near Farnham, 28 Oct 1956; 4871, Provincial Nursery, 30 Oct 1956; 6124, Lac Cascapédia, Gaspé Parc, 21 Aug 1957.

Usually scattered or gregarious on mossy conifer logs, occasionally solitary on ground under conifers.

Although not quite as common in the northeast as var. *amianthinum*, var. *sublongisporum* is widespread and often encountered. The spore size of specimens must be determined to separate the two varieties unless var. *amianthinum* f. *rugosoreticulum* is involved. The latter can be distinguished in the field by the rugose cap and often a green corn odor when the flesh is crushed.

Cystoderma pulveraceum (Pk.) Smith & Singer, Pap. Mich. Acad. Sci., Arts, Lett. **30:** 104. 1945.

Material examined. **Vermont:** *Bigelow* 9819, near Whitingham, Windham Co., 10 Sept 1961.

Solitary, on moss covered very decayed log under conifers.

Hygrophorus conicus (Fr.) Fr. Epicrisis, p. 331. 1838. *form.* Plate 1407.

Pileus 1.8-5.5 cm broad, conic at first then the margin spreading, umbo prominent and blunt, surface moist, radiate-fibrillose at first, often becoming squamulose, fibrils and scales black, ground color deep red at first, paler in age to reddish-orange then finally orange, ground color of expanded pilei obscured by black of scales except on the margin; context thin, firm but brittle, watery dingy citrine fading to whitish, finally black, no odor and taste.

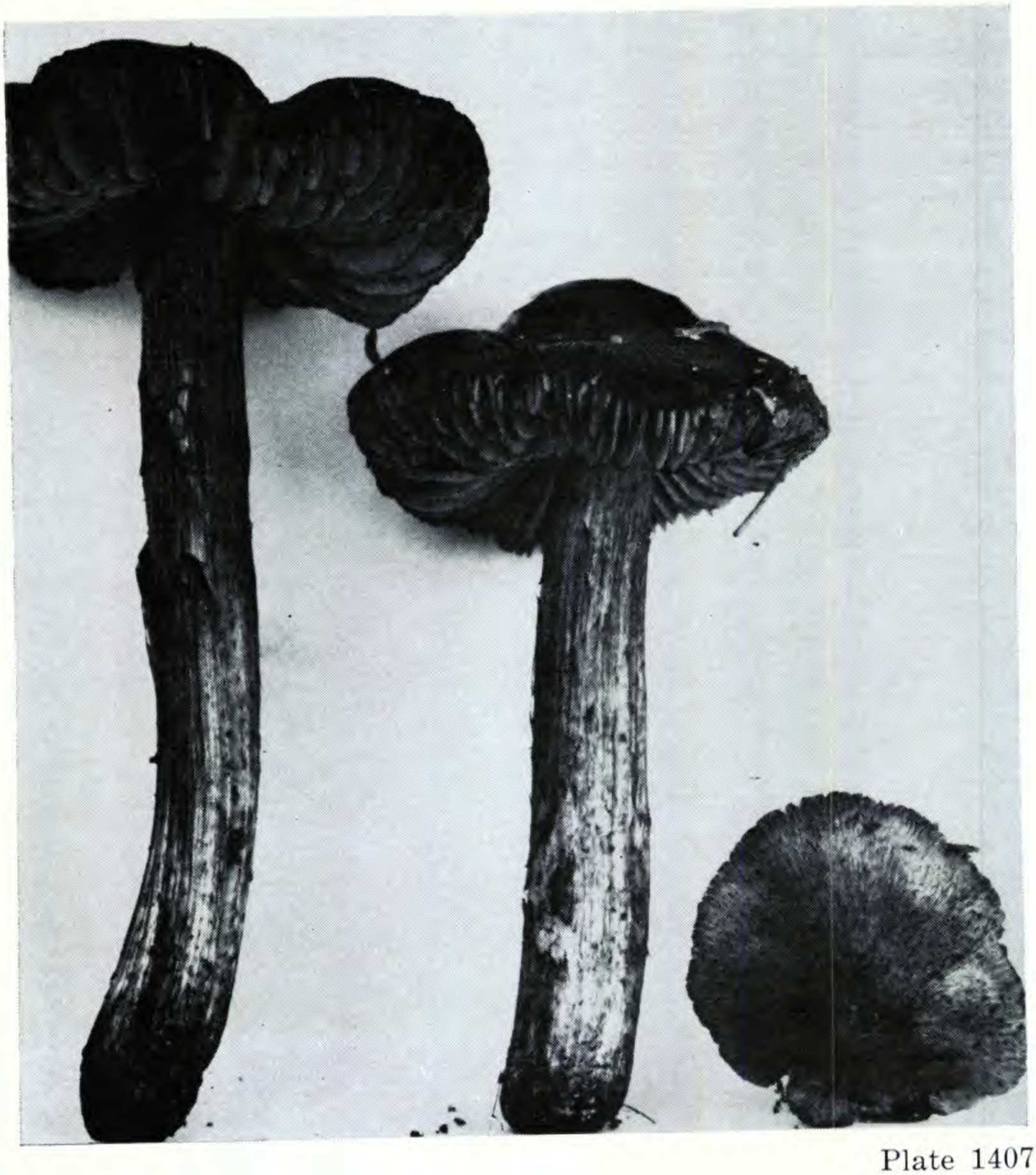


Plate 1407

Plate 1407. *Hygrophorus conicus* (Fr.) Fr. *form.* × 1.

Lamellae adnexed to free, close to subdistant, broad (up to 9 mm), ventricose or rounded near pileus margin, narrowest at the stipe, faces pale yellow at first, becoming sordid and darker yellow, finally reddish and with a bloom near the pileus margin, edges whitish at first, red marginate at times, blackening, uneven.

Stipe 3.5-8 cm long, 5-9 mm thick, equal or the base enlarged (up to 14 mm), hollow (interior blackening when cut), surface fibrillose striate, fibrils black over a greenish yellow ground color, often with a reddish blush in part or over the whole length.

Spores 10-12 × 5.5-7 μ, elliptic to obovate or oblong, slightly bent at times, smooth, olive black at times in KOH, not amyloid. Basidia

31.5-46 × 7-8.5 μ, 4-spored, often olive-blackish in KOH, blackness in contents, granular or diffuse. Cheilocystidia present on some gills, clavate to rostrate or mucronate, 30-60 μ long, 9-13 μ in diameter, agglutinated and blackened at times. Pleurocystidia not found. Pileus cutis dark olive black in KOH, pigment in contents — spotted or homogeneous, wall thickened at times, hyphae cylindric or somewhat inflated, 1.5-11 μ in diameter, trama olivaceous-yellow in KOH, appearing cellular at times, hyphae inflated, 15-19 μ in diameter, walls somewhat thickened. Hymenophoral trama parallel, hyphae cylindric to somewhat inflated, 4-17 μ in diameter. Clamp connections present. Refractive hyphae present.

Gregarious, on humus under hardwoods.

Material examined. **Vermont:** *Bigelow* 12998, Bingham Falls, near Stowe, Lamoille Co., 22 July 1964; 13032, Stowe, 23 July 1964; 13243, Bingham Falls, 3 Aug 1964.

With the black squamules over bright pileus colors, the red gills, and red blush on the stipe, this interesting variation of *H. conicus* is striking in the field. Typical specimens were found in the same general locality about the same time and weather conditions did not appear to be responsible for the different appearance. Comparison has been made with *H. conicoides* Orton, which also has red pigments, but the spores of the Vermont collections are identical with those of typical *H. conicus* and not elongate as in *H. conicoides*.

As far as I have been able to determine, cheilocystidia have not been reported for *H. conicus* before. These are difficult to identify in young lamellae, but are quite abundant in expanded ones. The red color leaches out of sections readily in KOH, but is obscured by other pigments if blackening has occurred.

Hygrophorus cossus Fr., Epicrisis p. 321. 1838.

Material examined. **Massachusetts:** *Bigelow* 15373, Conway State Forest, Franklin Co., 10 Oct 1967.

Gregarious, under hardwoods.

Hygrophorus fibrillosus Bigelow, *sp. nov.* Plate 1408.

Pileus 1.5-2.3 cm latus, convexus, margine decurvatus et incurvatus, siccus, opacus, fibrillosus, pallido-bubolinus; caro albida, crassa, solida, odore et sapore farinaceo. Lamellae decurrentes, confertae, angustae, incrassatae, subvinoso-griseae. Stipes 2.5-4.2 cm longus, 6-9 mm crassus, aequalis vel deorsum attenuatus, solidus, siccus,

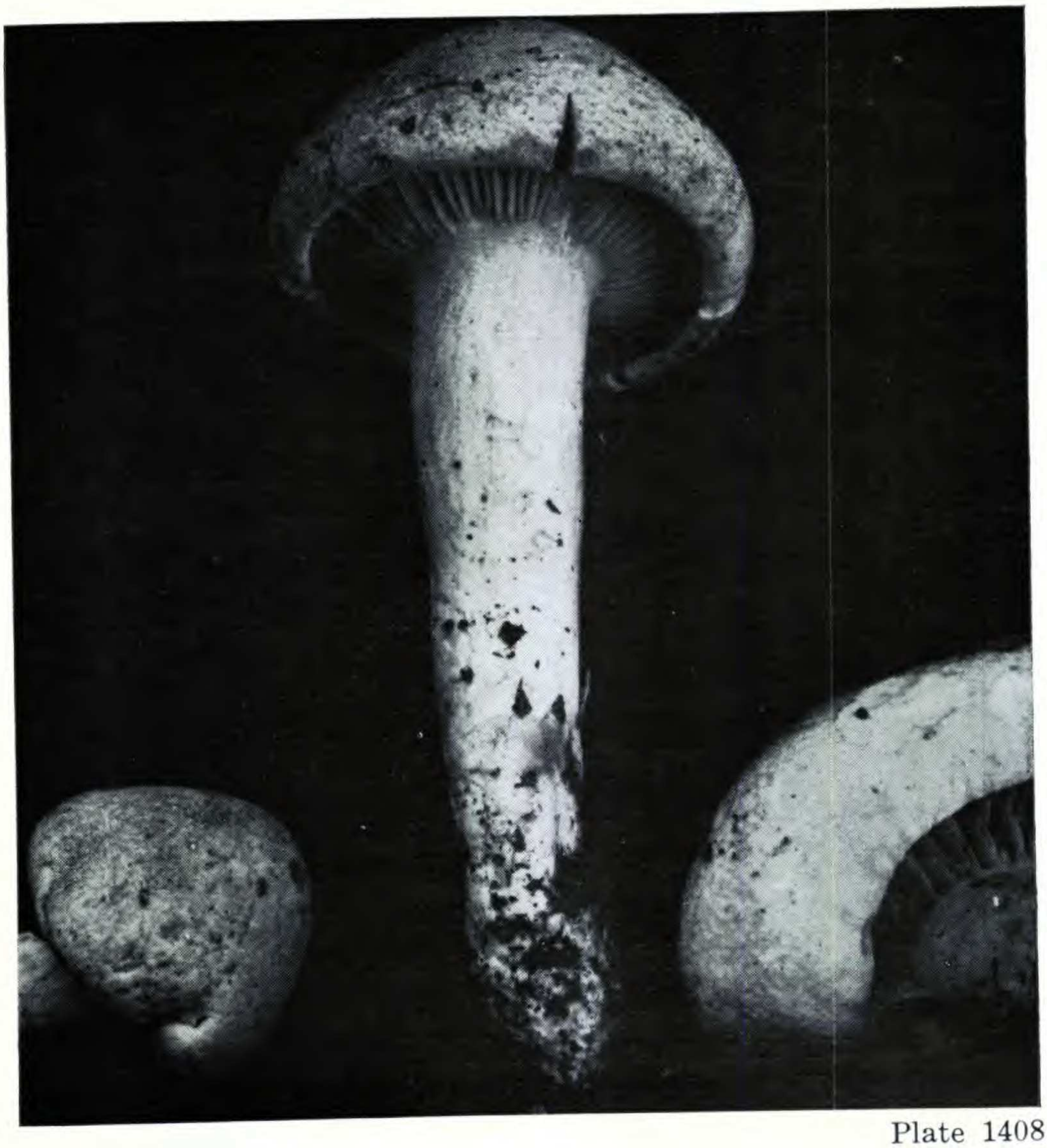


Plate 1408

Plate 1408. *Hygrophorus fibrillosus* Bigelow, sp. nov. × 2.

opacus, velutinus, pileus concolorus. Sporae (6-)7.5-9(-10) × (3-)3.5-4.5 μ, ellipticae vel oblongae vel subcylindricae, levi, amyloideis. Cheilocystidia 22-30 × 3-6 μ. Hyphis fibulatis.

Typum legit **H. E. Bigeloy**, n. 13331, Monroe State Park, Washington Co., Vermont, 6 Aug 1964, in Herb. Univ. Mass. conservatum.

Pileus 1.5-2.3 cm broad, convex with a strongly incurved and inrolled margin, surface dry and dull, heavily matted fibrillose under a lens, dingy pale buff colored (dingy "light buff"); context thick, dingy whitish, firm, odor and taste farinaceous; KOH — reddish brown.

Lamellae adnate, close, narrow, thickened, forked at times, gray ("pale drab gray"), edges even.

Stipe 2.5-4.2 cm long, 6-9 mm thick at apex, equal or tapering downward, solid (dingy whitish within), slightly curved at times, central, surface dry and dull, velvety under a lens, concolorous with pileus.

Spores (6-)7.5-9(-10) × (3-)3.5-4.5 μ, elliptic to oblong or rarely subcylindric, smooth, amyloid. Basidia 32-45 × 6-8 μ, 2- and 4-spored. Cheilocystidia cylindric or nearly so, 22-30 μ long, 3-6 μ thick, smooth, hyaline, flexuous at times, forked or irregular at times. Pleurocystidia not found. Pileus cutis an interwoven mass of cystidioid end cells, cylindric to subclavate, sometimes broadly fusoid or irregular, 4.5-11.5 μ in diameter, cells 24-70 μ long, brownish in KOH, pigment dilute in cell contents and in smooth thin walls, trama of similar hyphae only compact. Hymenophoral trama subregular but slightly divergent near the subhymenium, brownish in KOH, hyphae cylindric, 3-6 μ in diameter. Clamp connections present.

Gregarious, on soil and humus under birch and maple. August.

Material examined. **Vermont:** *Bigelow* 13331 (type), Monroe State Park, Washington Co., 6 Aug 1964.

All parts of the fresh carpophore show a color change to reddish or reddish brown when touched with drops of 3% KOH, but this is a curious reaction as the color is only at the edges of the drop. When revived sections of the cap and gills are mounted in KOH for microscopic study, the gills turn reddish promptly but soon fade out to pallid or yellowish. In addition, the cap and stipe darken overall to a light gray in drying.

By the amyloid spores and KOH reaction on the fresh carpophore *Hygrophorus fibrillosus* would seem close to *H. angelesianus* Sm. & Hesl., but the latter is distinctive by broader spores (4-5.5 μ), no cystidia, a viscid pileus, and dark sordid gray to grayish brown colors in pileus and stipe. The species of *Dermoloma* with amyloid spores as well as *Tricholoma griseum* Dennis and *Tricholoma hygrophorus* Joss. nom. nud. were also compared to *H. fibrillosus*, but none of these have the same diagnostic characters. *Tricholoma hygrophorus* is perhaps the nearest to *H. fibrillosus* but differs principally by the broad and distant lamellae and spores 5.9-6.5(-7) × 4.5-5.2 μ.

Hygrophorus marginatus var. **concolor** Smith, Pap. Mich. Acad. Sci., Arts, Lett. **38:** 59. 1953.

Material examined. **Maine:** *Bigelow* 11258, Cedar Lake, T3R9,

Penobscot Co., 24 Aug 1962. **Massachusetts:** 9714, Hawley Bog, Franklin Co., 10 Aug 1961. **New Hampshire:** 12257, Pinkham Notch, White Mountains Nat. Forest, 15 Aug 1963. **Rhode Island:** 14406, Beach Pond State Park, Exeter Co., 22 July 1965. **Vermont:** 13084, Ranch Brook, near Stowe, Lamoille Co., 27 July 1964; 13223, Bingham Falls, near Stowe, Lamoille Co., 3 Aug 1964.

Hygrophorus marginatus var. **olivaceus** Smith & Hesler, Lloydia **5:** 40. 1942.

Material examined. **Maine:** *Bigelow* 10997, Abol Field near Baxter State Park, Piscataquis Co., 14 Aug 1962; 11331, Upper Togue Pond, Piscataquis Co., 27 Aug 1962; **New Hampshire:** 11870, Sawyer Rock, White Mountains Nat. Forest, 20 July 1963. **Vermont:** 12922, Lake Mansfield, Lamoille Co., 20 July 1964; 13408, Morristown, Lamoille Co., 12 Aug 1964.

Hygrophorus recurvatus Peck, New York St. Mus. Bull. **157:** 28. 1912.

Plate 1409

Plate 1409. *Hygrophorus schulzeri* Bresadola. × 2.

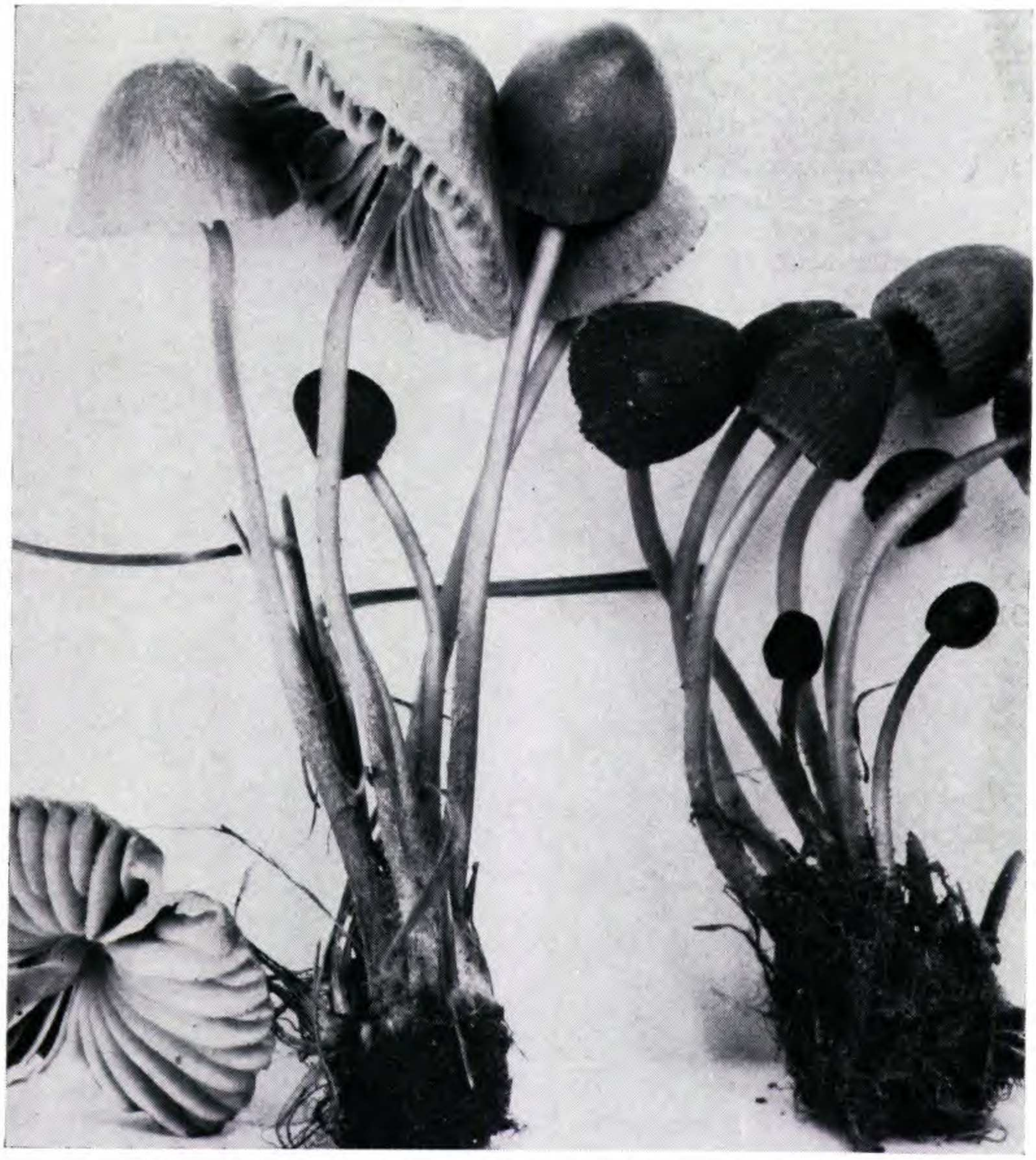


Plate 1410. *Mycena citrinomarginata* Gillet. × 2.

Material examined. **Massachusetts:** *Bigelow* 14985, Conway, Franklin Co., 24 Oct 1966.

Gregarious or subcespitose, on lichen-covered very rotten conifer stump in old pasture.

Hygrophorus schulzeri Bresadola, Fungi Trident. 1: 57. 1884. Plate 1409.

Material examined. **Connecticut:** *Bigelow* 15493, Audubon Center, Sharon, Litchfield Co., 27 July 1968. **Massachusetts:** 15225, Mt. Toby, Sunderland, Franklin Co., 10 Aug 1967.

Gregarious or subcespitose, under hardwoods or mixed woods.

Hygrophorus tephroleucus (Fr.) Fr. var. **tephroleucus,** Epicrisis p. 328. 1838.

Material examined. **Vermont:** *Bigelow* 14366, Worcester, Washington Co., 5 Oct 1964.

Gregarious, on sphagnum patch in spruce woods.

Mycena citrinomarginata Gillet, Les Hyménomycètes, p. 266. 1874.

Plate 1410.

Pileus 4-20 mm broad, subcylindric at first becoming conic then conic-campanulate, subviscid but soon merely moist, opaque, sulcate striate, edge crenate or ragged in age, glabrous, fuscous umber fresh, hygrophanous and slowly fading to sordid yellow; context thin, not fragile, concolorous and fading with pileus, odor strong, earthy or raphanoid when flesh is crushed, taste similar.

Lamellae adnate to subdecurrent, close to subdistant, narrow to moderately broad, grayish, edges fimbriate and brown marginate.

Stipe 2-5 cm long, up to 2 mm thick at apex, equal or the base slightly enlarged, base tomentose, surface above with a thin fibrillose coating, glabrescent, central, hollow, often curved, sordid yellow.

Spores (7-)8-10(-12.5) × 4.5-6 μ, elliptic, smooth, amyloid. Basidia 23-35 × 6-8 μ, 4-spored. Cheilocystidia 22-55 μ long, fusoid ventricose, apex 1.5-3 μ broad, 6-8 μ broad at enlarged portion, branched and flexuous at times, hyaline. Pleurocystidia not found. Pileus cutis vinaceous in Melzer's, brown in KOH at first but fading to yellowish, pigment in cell contents, surface with thin gelatinous pellicle, cutis of flexuous and branched hyphae, 1-2 μ in diameter, with numerous digitate processes, some hyphae originating in hypoderm, cellular hypoderm conspicious, cells 22-50 μ broad, tramal hyphae cylindric to inflated, 2-16 μ in diameter. Hymenophoral trama subcellular, hyphae or cells 3.5-24 μ in diameter, dextrinoid in Melzer's. Clamp connections present.

Gregarious or cespitose, on lawn in the open.

Material examined. **Massachusetts:** *Bigelow* 14911, Baptist Hill, Conway, Franklin Co., 2 Oct 1966; 15613, same locality, 20 Oct 1968.

The collection cited appears to be the dark form of *M. citrinomarginata* discussed by Smith (1947). Besides pileus color, this form differs in other respects from the pale form as described by Smith. He gives the odor and taste as 'not distinctive", the pellicle as "non-gelatinous", and no mention is made of digitate processes as found on the cutis hyphae of no. 14911. Whether these differences are sufficient to separate the dark form with at least varietal status is uncertain in view of the extreme variability found in this species by Smith.

Plate 1411

Plate 1411. *Tricholomopsis sulphurea* (Pk.) Bigelow. × 1½.

Tricholomopsis sulphurea (Pk.) Bigelow, *comb. nov.* Plate 1411.

Clitocybe sulphurea Peck, New York State Mus. Rep. 41: 62. 1888.

Pileus 2.5-6(-9.4) cm broad, convex at first with an incurved margin, becoming broadly convex or plane with a decurved margin, subumbonate to somewhat umbilicate or shallowly depressed, margin even, surface glabrous, often lubricous when moist, at times slightly fibrillose at the margin under a lens, disc sometimes slightly velvety, subhygrophanous, a watery dull yellow moist (near "honey yellow"), paler yellow faded (near "colonial buff" or "deep colonial buff"), streaked when fading; context thin, pliant, pale yellow, odor and taste mild. Orange to reddish in KOH then brown.

Lamellae adnate or somewhat sinuate, close to subdistant, broad (up to 10 mm), abruptly tapered near pileus margin, not forked or intervenose, light yellow ("maize yellow" to "naples yellow"), darkening in age (near "chamois") but not changing color when bruised, edges crenate.

Stipe 2-4(-5) cm long, 5-9(-11) mm thick at apex, equal or the base swollen, usually curved, stuffed then hollow, surface innately fibrillose striate, concolorous with pileus or lamellae but fading more slowly, eccentric at times.

Spores (5.5-)6-8 × (4-)4.5-5.5(-6) μ, broadly elliptic, smooth, not amyloid, white in deposit. Basidia 23-37(-41.5) × (4-)6-7.5 μ, 4-spored, hymenium yellow to golden in KOH. Cheilocystidia abundant, clavate to bulbous, pedicellate, 25-58 μ long, (8-)11-23(-27) μ in diameter, hyaline or contents yellowish to orangish, walls slightly thickened, smooth, agglutinated in age. Pleurocystidia scattered or rare, cylindric to somewhat fusoid or subclavate, (25-)46-70 μ long, 4.5-8.5 μ in diameter, hyaline and shiny, smooth. Pileus section reddish at first in KOH but soon fading, cutis dingy orangish or golden-yellow, pigment as fine encrustrations or in slightly thickened walls, cutis hyphae mostly cylindric, 4-8.5 μ in diameter, trama paler than cutis, hyphae cylindric to inflated, 4-15.5 μ in diameter, walls thin or slightly thickened. Hymenophoral trama of parallel or subparallel hyphae, hyaline or pale yellowish, hyphae cylindric or somewhat inflated, 4-13 μ in diameter, walls thin or slightly thickened. Clamp connections present. Colored refractive hyphae present.

Scattered or gregarious, on conifer logs. September and October.

Material examined: **Massachusetts:** *Bigelow* 9395, Mt. Toby, Sunderland, Franklin Co., 2 Oct 1960; 11569, Shutesbury, Franklin Co., 9 Oct 1962; 14658, Conway, Franklin Co., 19 Oct 1965; 15309, Conway, Franklin Co., 10 Oct 1967. **New York:** *C. H. Peck*, Wittenburg Mountain, Sept (type) (NYS). **Vermont:** *Bigelow* 14270, Ranch Brook trail, near Stowe, Lamoille Co., 28 Sept 1964.

The discovery that this species of Peck's is a *Tricholomopsis* necessitated a comparison with three other North

American species of this genus. The types of *Agaricus (Pleurotus) sulphureoides* Peck, *Agaricus (Tricholoma) flavescens* Peck, and *Tricholomopsis bella* Smith, were re-examined with special attention to the details of pigmentation in the pileus cutis. On the basis of microscopic characters, the species can be separated into two groups. A *sulphureoides* and *A. flavescens* had no encrusted hyphae when studied with a phase microscope and 100X oil immersion objective, but encrusted hyphae were found on the cuticular hyphae of the types *Clitocybe sulphurea* Peck and *T. bella*. In the first two, the coloration appears to be dilute in the cell contents and in slightly thickened smooth walls. In addition to the differences in pigment, *C. sulphurea* and *T. bella* had larger cheilocysts (viz. 35-60 × 15-23 μ, and 23-75 × 10-25 μ, respectively) than *A. sulphureoides* and *A. flavescens* (33-50 × 7.5-13 μ and 31-44 × 9-17.5 μ respectively).

Further distinction between the species is by means of macroscopic features. With the types of *A. sulphureoides* and *A. flavescens* (NYS) are watercolor sketches and these present different appearing agarics. *A sulphureoides* has numerous small dark brown scales over a dull sulphur yellow ground color and a small brownish umbo. In comparison with the sketch of *A. flavescens*, *A. sulphureoides* is smaller, has thinner flesh, and is a generally more intensely colored species. *A. flavescens* is light yellow (almost citrine yellow), glabrous, and with a rather robust *Tricholomoid* stature. In the original descriptions Peck stated that *A. sulphureoides* can be smooth, and that *A. flavescens* can crack into minute scales on the disc, but these conditions are not evident in the sketches. The microscopic characters of the two types are nearly identical.

T. bella is separated from *T. sulphurea* also by field characters. The pileus surface of *T. bella* is coarsely fibrillose with squamules on the umbo and margin. The color is darker — dull ochraceous beneath darker ochraceous fibrils in contrast to the yellow shades of *T. sulphurea*. The lamellae of *T. bella* stain dull rusty brown when bruished,

a state not observed in *T. sulphurea.* Pleurocystidia are rare and difficult to find in sections of *T. sulphurea,* but are abundant in *T. bella.* The latter has been found in New England and is described below to add information to the type description.

By the scaly cap, *T. ornata* (Fr.) Sing. appears to be closest to *T. sulphureoides,* but this European species has spores which are elliptic-cylindric, 5.5-8 × 3.3-4 μ, according to Favre (1952). The cheilocysts of *T. ornata* often have appendages, which I did not find in the type of *A. sulphureoides.* There is no information given by Favre about the details of pigmentation nor about pleurocystidia.

In Smith's (1960) treatment of *Tricholomopsis* a fibrillose veil was emphasized in distinguishing *T. sulphureoides* from *T. flavescens* (as *T. thompsoniana*) and *T. bella.* The relation of *C. sulphurea* was not known at this time and thus not compared. Of the four types, none are known definitely to have a veil by the author's descriptions. The sketches with the types of *A. sulphureoides* and *A. flavescens* (NYS) do not show veils unfortunately, and the specimens of all four type collections are too expanded to show any distinct veils even if present when young. All were examined under the dissecting microscope, but the very few fibrils visible on the pilei margins or stipe apices at times were inconclusive evidence of a veil. However, veils do exist in this group as Smith reported for *T. sulphureoides,* and as known now in *T. bella,* Bigelow no. 15325. The presence or absence of a veil is a difficult characteristic to use in diagnosis of a species in this group though, as rarely does one collect carpophores small enough to distinctly show, or rule out, this structure.

Of possible use in further assisting the separation of the four species discussed above is the reaction of fresh carpophores to 3% KOH. All of the species have not been tested yet, but two collections of *T. sulphurea* showed a distinct orange to red color when drops of KOH were placed on any part. Slowly, the color changed to dull brown.

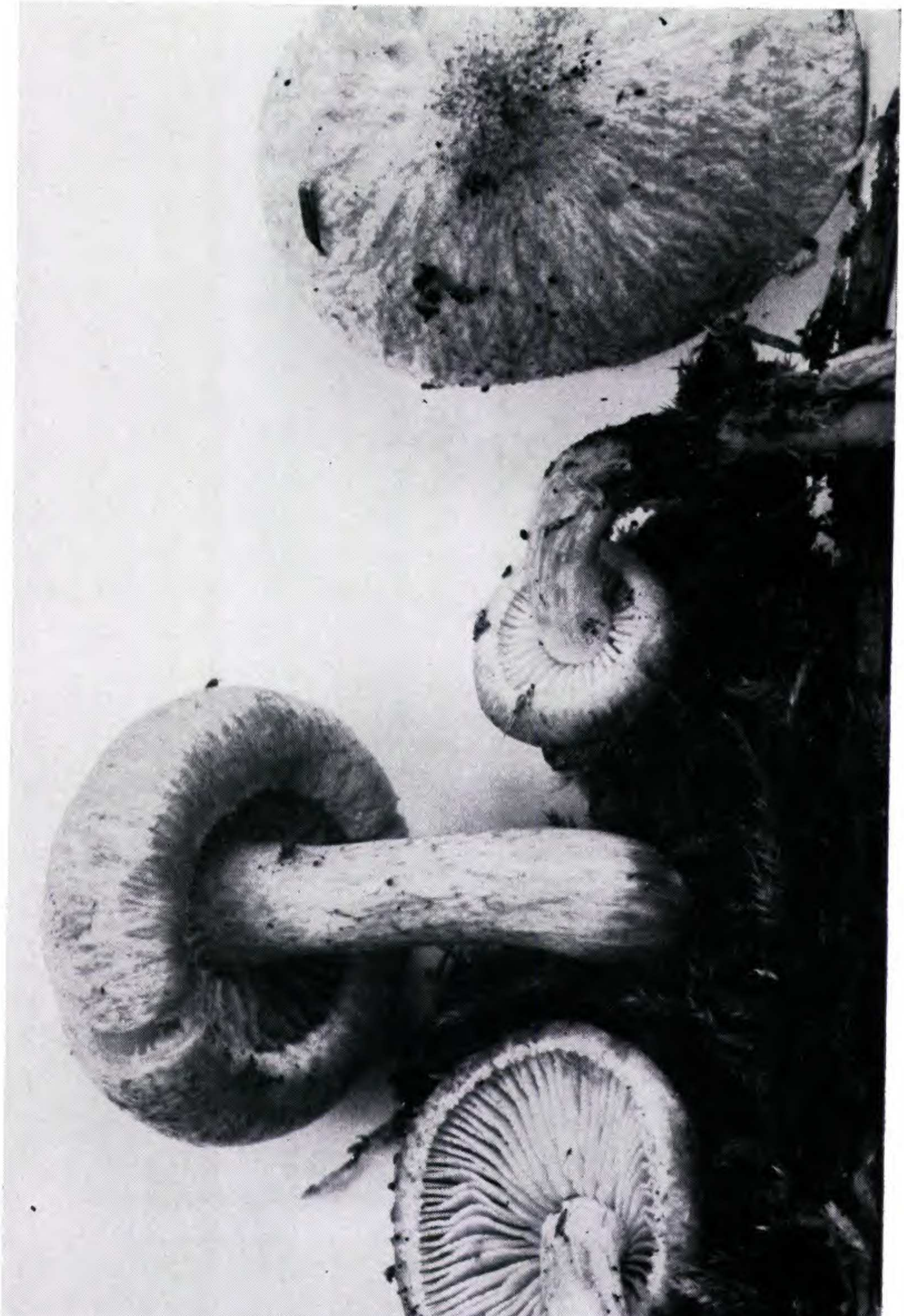


Plate 1412

Plate 1412. *Tricholomopsis bella* Smith. × 1½.

Tricholomopsis bella Smith, Brittonia **12:** 64. 1960. Plate 1412.

Pileus (0.8-)2.5-6.5 cm broad, convex with a strongly incurved margin at first, expanding to broadly convex, with a low broad umbo at times, margin edge tomentose in buttons then appressed squamulose, appressed fibrillose-scaly or coarsely radiate fibrillose to the rather velvety disc, subhygrophanous at times, ochraceous (nearest "antimony yellow"), disc slightly darker in expanded pilei, paler and more yellowish in age and loss of moisture; context thin except on disc, firm, ochraceous to yellow, no odor and taste.

Lamellae adnexed usually but adnate or short decurrent in large specimens, close, moderately broad, concolorous with the pileus or more yellowish, not fading, edges crenate, becoming brown in age and bruising.

Stipe 2.5-4.5 cm long, 5-10 mm thick at apex, equal or base enlarged, hollow, surface fibrillose, heavily fibrillose at apex in buttons and fibrils attached to pileus edge, soon ruptured, concolorous with moist pileus but base becoming watery brownish when bruised.

Spores 5.5-7 × (3.5-)4.5-5.5 μ, broadly elliptic or elliptic, smooth, not amyloid, white to faintly cream in deposit. Basidia 36-40 × 5.5-7 μ, 4-spored. Cheilocystidia clavate to clavate-bulbous, pedicellate, at times basidioid or irregular-cylindric, hyaline or golden yellow, 23-65 μ long, (4.5-)10-22.5(-26) μ broad, usually abundant. Pleurocystidia basidioid to cylindric in shape but refractive, pale yellowish, embedded, 31-61 μ long, 5-6 μ broad, scattered at times. Pileus cutis brownish golden in KOH, pigment finely encrusted or in slightly thickened walls, hypae mostly cylindric, 5.5-11.5 μ in diameter, trama pale yellow, hyphae cylindric or somewhat inflated, 4.5-15.5 μ in diameter. Hymenophoral trama subparallel, yellowish in KOH (paler than hymenium), hyphae mostly slightly inflated, (6-)8.5-19 μ in diameter, walls often slightly thickened. Clamp connections present. Yellow refractive hyphae present.

Scattered on conifer log. September.

Material examined. **Massachusetts:** *Bigelow* 15325, Conway, Franklin Co., 28 Sept 1967. **Michigan:** *Smith* 42508 (type), Wilderness Point, Emmet Co., 7 Sept 1953. (MICH) **New Hampshire:** *Bigelow* 12429, South Conway, Carroll Co., 4 Sept 1963.

ASCOMYCETES

Berlesiella nigerrima (Blox.) Sacc. Rev. Mycol. **10:** 7. 1888. Figs. 1-5.

Sphaeria nigerrima Bloxam ex Currey, Linn. Soc. London Trans. **22:** 272. 1858.

Pleospora nigerrima (Blox.) Sacc. Syll. Fung. **2:** 276. 1883.

Dothidea episphaeria Peck, New York St. Mus. Rept. **30:** 64. 1878.

Phyllachora episphaeria (Pk.) Sacc. Syll. Fung. **2:** 608. 1883.

Bertia parasitica H. Fabre, Ann. Sci. Nat. Bot. 6 sér. **9:** 95. 1878.
Homostegia parasitica (Fabre) Rehm, Hedwigia **26:** 96. 1887.
Berlesiella parasitica (Fabre) v. Höhnel, Sitzungsber. Kais. Akad. Wiss. Wien, Math.-nat. Kl. Abt. 1, **124:** 60. 1915.
Pachythyrium parasitica (Fabre) Arnaud, Soc. Myc. Fr. Bull. **69:** 302. 1953. Nom. non spec.
Trichothyrina parasitica (Fabre) v. Arx in Müller & v. Arx, Beitr. Kryptogamenfl. Schweiz **11**(2): 559. 1962. Nom. non spec.
Valsa pulviniceps Peck, New York St. Mus. Rept. **32:** 50. 1879.
Cryptospora pulviniceps (Pk.) Sacc. Syll. Fung. **9:** 940. 1891.
Anthostoma pulviniceps Peck in Ellis & Ev. North Amer. Pyreno. p. 578. 1892.
Cucurbitaria setosa Ell. & Ev. Phila. Acad. Nat. Sci. Proc. **42:** 241. 1890, non *C. setosa* Winter.
Berlesiella setosa (Ell. & Ev.) Sacc. Syll. Fung. **9:** 915. 1891.
Gibberidea setosa (Ell. & Ev.) Kuntze, Rev. Gen. Pl. **3**(3): 481. 1898.
Cucurbitaria echinata Ell. & Ev. North Amer. Pyreno. p. 240. 1892, nom. nov. for *C. setosa* Ell. & Ev.
Berlesiella echinata (Ell. & Ev.) Berl. Icon. Pyren. **2:** 112. 1897.
Pleosphaeria echinata (Ell. & Ev.) Miller, Mycologia **33:** 78. 1941.

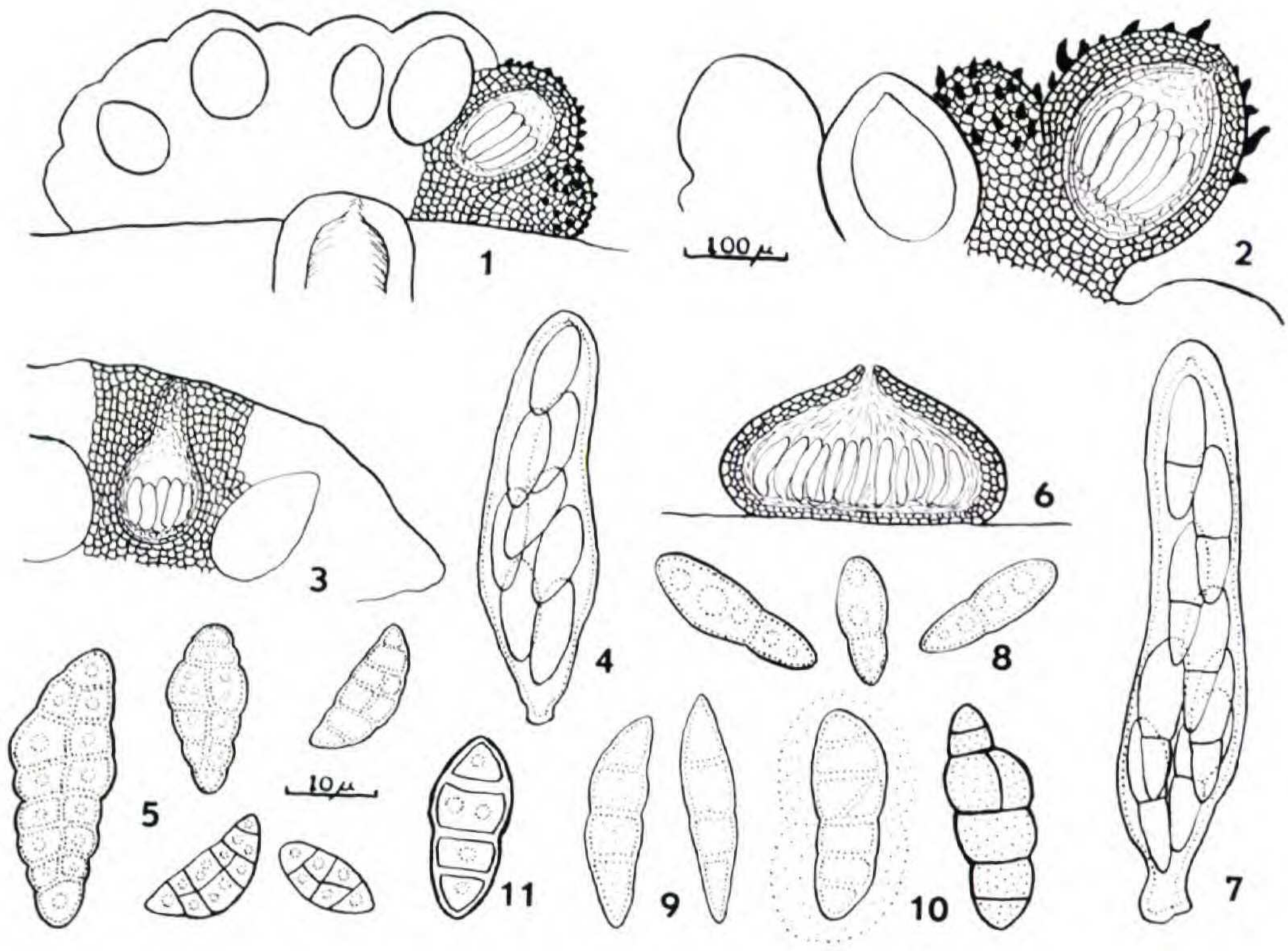
Stromata velvety black, superficial on ostioles or stromata of members of Diatrypaceae, pulvinate, 1-2 mm diameter or larger by confluence, 120-460 μ high, surface regular or raised into rounded protuberances by erumpent upper portions of locules, roughened by hyphal tips, short cells, or setae up to 48 μ long, dark reddish brown to black; locules entirely immersed in stroma or partially erumpent, globose or laterally compressed and conic, 50-120 μ in diameter, 85-200 μ high, locule wall reddish brown, composed of several layers of polygonal cells and narrow hyaline inner layers, stromatic tissues of polygonal brown or reddish brown cells, blackened toward surface, often in upright rows in interior, opening by lysigenous canal and pore, stuffed with ± gelatinizing hyphae and appearing periphysate. Asci 36-67 × (7.5-)9.5-16(-24) μ, oblong to saccate, bitunicate, apex rounded and thickened, narrowed to foot-like base, in gelatinizing remnants of locule tissue. Ascospores 12-20(-24) × 4-6(-7.5) μ, light dull brown or olivaceous brown, obovate-fusoid, straight to inequilateral, (3-4-)5-6-(7-) septate, one vertical septum in one or all of middle cells but not extending through end cells, slightly constricted at the septa and cells protruding out to form a rather irregular outline, one or two globules in each cell, wall smooth, overlapping biseriate or crowded in the ascus.

Superficial, hypersaprophytic on old stromata of members of Diatrypaceae.

Material examined. **Massachusetts:** *Barr* 5248, Mohawk Trail State Forest, Franklin Co., 4 Oct 1968; **New York:** *Peck*, Maryland, Otsego Co., Sept (type of *Dothidea episphaeria*, NYS); Richmondville, Schoharie Co., Sept 1878 (type and isotype of *Valsa pulviniceps* and *Anthostoma pulviniceps*, NYS). **Ontario:** *Dearness*, London, July 1894 (as *Cucurbitaria echinata*, Ell. & Ev. N.A.F. 3109). **France:** *Rehm*, Ascom. exs. 2175 as *Bertia parasitica* (MICH); *Flageolet*, Rigny-sur Arroux, Saone-et-Loise, 1918 as *Berlesiella nigerrima* (NYS).

The collections listed above vary in appearance of the stroma. Completely immersed locules with only scattered hyphal tips roughening the surface occur in *Dothidea episphaeria* (fig. 3). Slightly protruding apices of locules, covered by numerous short black cellular contorted setae are found in *Bertia parasitica* (fig. 1). Mostly erumpent locules whose stromatic surface bears more elongate pointed setae in *Cucurbitaria echinata* and *Valsa pulviniceps* (fig. 2) complete the series. The locules, asci, and ascospores are all similar within the size range described. Only one rather variable species seems to be involved. Chenantais (1921) has discussed the synonymy of *nigerrima* — *setosa* — *parasitica*. He was unable to study Peck's *Dothidea episphaeria* to determine its disposition. Peck misinterpreted the fungus called *Valsa pulviniceps*, for his description included that of perithecia of the *Eutypa* as well as the locules with asci and ascopores of the *Berlesiella*. Fabre's *Bertia parasitica* has been involved in the synonymy of *Trichothyrium epimyces* (Sacc., Bomm. & Rouss.) Theissen. This latter species is also hypersaprophytic on other pyrenomycetes, but has small flattened ascostromata with radiating wall structure and hyaline one-septate ascospores. Fitzpatrick (1923), Arnaud (1953), and Müller and von Arx (1962) included *Bertia parasitica* with *Microthyrium epimyces* and *Nitschkea flageoletina* Sacc. However, Fabre's original description and figures of *Bertia parasitica* indicate that his fungus was indeed *Berlesiella* rather than *Trichothyrium*.

The genus *Berlesiella* is presently the only stromatic member of the small family Herpotrichiellaceae Munk.



Figures 1-11

Figs. 1-5. *Berlesiella nigerrima:* 1-3, sections through stromata of varying types, 4, ascus, 5, ascospores. Figs. 6-8. *Seynesiella exigua:* 6, ascostroma in section, 7, ascus, 8, ascospores. Fig. 9. *Leptosphaeria macrospora*, ascospores. Fig. 10. *Pleospora vitalbae*, ascospores. Fig. 11. *Thyridaria rubro-notata*, ascospore.

Earlier (in Bigelow and Barr, 1963) I followed Müller and von Arx (1962) in placing members of this family among the Pleosporaceae, but now consider that the Herpotrichiellaceae must be upheld. Despite the few species presently recognized and the lack of developmental studies, the mature locule represents more the Dothidea than the Pleospora type of development. The family Herpotrichiellaceae is tentatively considered most closely allied to the Capnodiaceae in the Dothideales.

Seynesiella exigua Barr, *sp. nov.* Figs. 6-8.

Ascostromata 200-265 μ diametro, 100 μ alto, poro 10.5-12 μ pertuso, peridio lateralis brunneis, radiatis, basalis tenuissima. Asci 36-60 × 7.5-9 μ, bitunicatae, oblongis vel saccatis. Ascosporae 10.5-15 × 3-4.5 μ, pallidae viridae, ellipticae, infra medium septatae.

Specimen typicum in foliis emortuis *Juniperi communi* L., prope

"Lac Diable, Mont Albert, Gaspé Provincial Park, Quebec, 19 Aug 1957", a **M. E. Barr** n. **2202** lectus; in herb. Univ. Mass. depositum.

Ascostromata 200-265 μ in diameter, about 100 μ high, pore 10.5-12 μ wide, basal wall thin and light brown, side walls blackish brown, of radiating rows of cells. Asci 36-60 $\times$ 7.5-9 μ, bitunicate, apex thickened, oblong to somewhat saccate, sessile, pseudoparaphysate. Ascospores 10.5-15 $\times$ 3-4.5 μ, greenish hyaline, elliptic, straight to inequilateral, septate below middle, constricted at septum, wall smooth, contents with two or three globules in each cell, crowded in the ascus.

On dead leaves of *Juniperus communis* L.

Material examined. **Maine:** *Barr* 4789, Yellowhead Point, near New Harbor, Lincoln Co., 30 July 1965. **New Hampshire:** 3880, South Conway, Carroll Co., 11 July 1963. **Quebec:** 2194, 2202 (type), Lac Diable, Mont Albert, Gaspé Prov. Park, 19 Aug 1957. **Vermont:** 4278, Stowe Pinnacle trail, near Stowe, Lamoille Co., 11 July 1964.

This fungus is similar in appearance to *Seynesiella juniperi*, the type species of the genus. It differs from the previously described species by its much smaller ascospores. *Stigmatea sylvatica* Sacc. was described from leaves of *Juniperus*, but has ascostromata 110-120 μ in diameter and hyaline ascospores 10 $\times$ 3 μ. *Seynesiella*, with applanate ascostromata, radiating wall structure, and thin basal wall, seems best placed in the Microthyriaceae of the Hemisphaeriales.

Three species belonging to the Pleosporaceae are reported from North America for the first time. These are:

Leptosphaeria macrospora (Fckl.) Thümen, Myc. univ. n. 1359. 1879. Fig. 9.

Material examined. **Maine:** *Barr* 3339, on *Rumex obtusifolius*, Katahdin Lake trail, Baxter State Park, Piscataquis Co., 7 July 1962. **Vermont:** 4482, on *Eupatorium fistulosum*, Munroe State Park, North Duxbury, Washington Co., 6 Aug 1964.

The ascospores of these two collections are in the low end of the size range given by Holm (1957) — (20-)28-33 $\times$ 4-5.5 μ for the North American collections, 29-40 $\times$ 4.5-6 μ for European collections. They approach *L. senecionis* (Fckl.) Winter in size (24-30 $\times$ 6.5-7.5 μ according to Holm), but differ in shape. Those of *L. macrospora* taper to a point especially at the basal end, while in *L. senecionis* the ends are obtuse. *L. macrospora* is an entirely different fungus from *Pyrenophora macrospora* (Schroet.) Wehm., although both were originally described as *Pleospora*. Schroeter's name is the later

and a new name must be provided for the species now called *Pyrenophora macrospora.*

Pleospora vitalbae (de Not.) Berl. Nuov. Giorn. Bot. Ital. **20:** 70. 1888. Fig. 10.

Material examined. **Maine:** *Barr* 3741, on *Clematis virginiana,* Katahdin Lake trail, Baxter State Park, Piscataquis Co., 1 Sept 1962.

The ascospores of *P. vitalbae* have a single vertical septum in one or two of the middle cells, and the species was described in *Leptosphaeria.* This fungus is known from *Clematis* in Europe and also from *Ilex* from Argentina, but has not been reported from North America to my knowledge.

Thyridaria rubro-notata (Berk. & Br.) Sacc. Syll. Fung. **2:** 141. 1883. Fig. 11.

Material examined. **Vermont:** *Barr* 4306, on *Acer* bark, Stowe Hollow, Lamoille Co., 14 July 1964.

The grouped ascostromata of *T. rubro-notata* have a vinaceous tinge to the hyphae of the papillate apices. Wehmeyer (1941) described the species from European specimens.

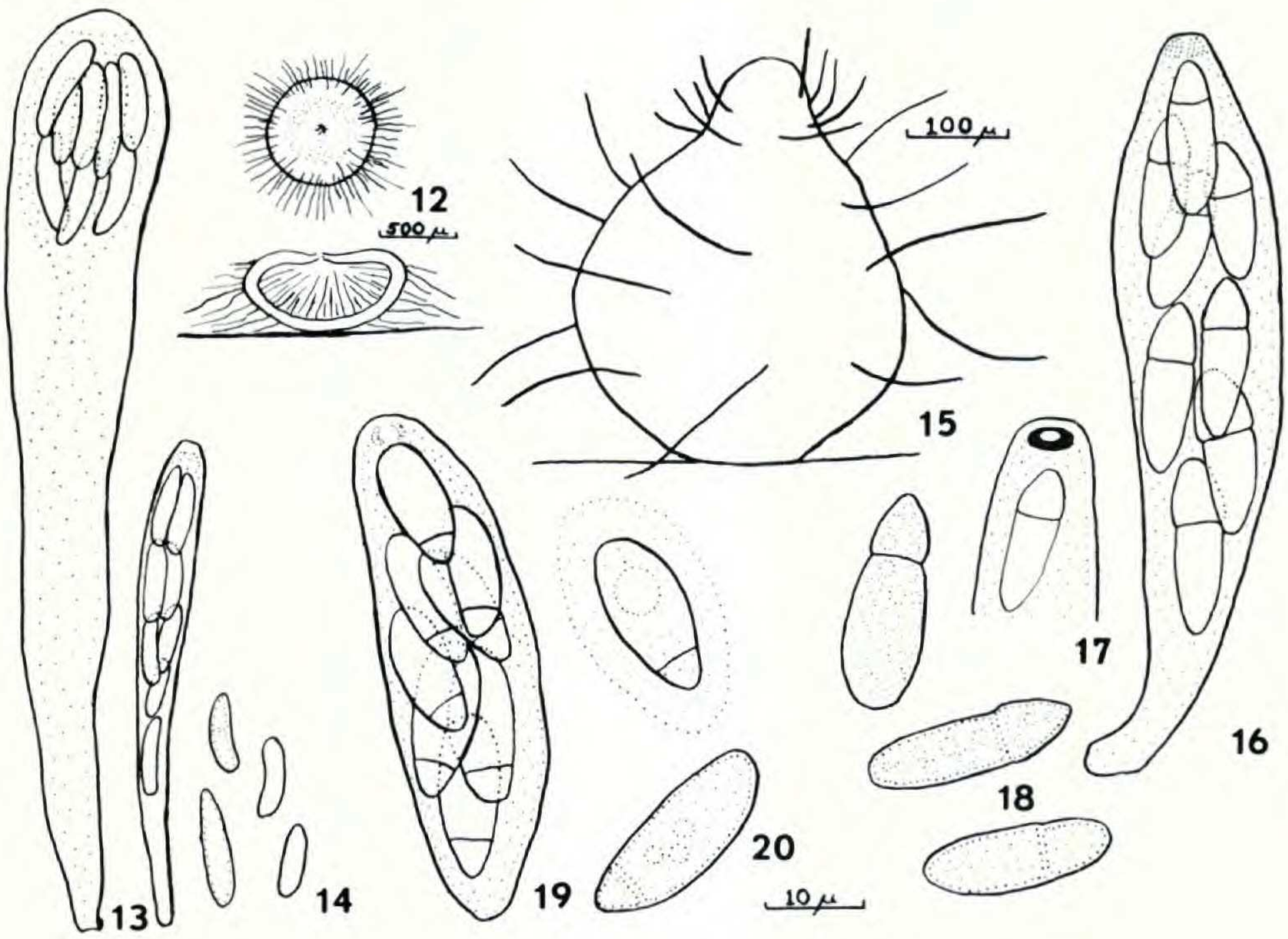
Enchnoa subcorticalis (Peck) Barr *comb. nov.* Figs. 12-14.

Sphaeria subcorticalis Peck, New York St. Mus. Rept. **28:** 77. 1876.

Trichosphaeria subcorticalis (Peck) Sacc. Syll. Fung. **1:** 454. 1882.

Perithecia scattered to grouped beneath bark and often adhering to bark when the latter is removed, 540-1000 μ in diameter, depressed globose and collapsing cupulate, surrounded by fringing hyphal tomentum, hyphae dark brown, thick-walled, distantly septate, 4.5-6.5 μ wide; perithecial wall fragile but thick, externally 50-66 μ wide, composed of layers of polygonal brown cells, internally 80-115 μ wide, composed of layers of light brown to hyaline compressed cells; apical pore minute. Asci numerous, unitunicate, arising from inner wall layers among delicate, hyaline paraphyses, of two sizes: 1) clavate, long-stipitate (55-100 $\times$ 5-6 μ), p.sp. 44-55 $\times$ 10-16.5 μ, with rounded or conical apex; 2) elliptical, short-stipitate, 27.5-30 $\times$ 5.5-6.5 μ, neither ascus type bearing apical apparatus or staining differentially, irregular opening visible at apex of empty asci, 8-spored. Ascospores similar in both types of asci, 7.5-11(-14) $\times$ 1.5-2.5(-3) μ, greenish hyaline, yellowish, to light olive- or gray-brown, cylindric to allantoid, ends rounded, rarely narrowed, 1-celled or at times with a pseudoseptum, contents minutely guttulate or as single globule, wall thin and smooth, clustered near apex of large asci, overlapping biseriate in small asci.

On old branches of *Carpinus caroliniana,* among remnants of stromatic pyrenomycetes.



Figures 12-20

Figs. 12-14. *Enchnoa subcorticalis:* 12, perithecia from above and in section, 13, two asci illustrating size differences, 14, ascospores. Figs. 15-18. *Pseudomassaria inversa:* 15, perithecium, 16, ascus, 17, ascus apex with amyloid annulus, 18, ascospores. Figs. 19-20. *Pseudomassaria thistletonia:* 19, ascus, 20, ascospores.

Material examined. **Massachusetts:** *Barr* 5131, Mt. Toby, Sunderland, Franklin Co., 14 May 1968. **New York:** *Peck,* North Greenbush, Rensselaer Co., June 1874 (type, NYS).

For making disposition of Peck's fungus, the characteristics of large depressed perithecia surrounded by hyphal tomentum and allantoid ascospores agree with those of other species of *Enchnoa.* The formation of two sizes of asci is a distinctive feature of this species, and indeed is most uncommon in the pyrenomycetes.

The genus *Enchnoa* is not well known and has been relegated to several families in the past. Von Höhnel's (1909, 1918) suggestion of close relationship between *Enchnoa* and *Calosphaeria* has much merit. These two genera, with a few others, comprise the family Calosphaeriaceae in which the perithecia are scattered to grouped,

with a thick but fragile wall, containing asci in broad paraphyses, with ascospores typically allantoid, rarely elliptical or short cylindrical. In the Xylariales, the Calosphaeriaceae seem most closely related to the Sphaeriaceae.

Pseudomassaria inversa Barr, *sp. nov.* Figs. 15-18.

Perithecia 270 μ diametro, 350 μ alta, conica, erumpente vel superficialia, peridium usque ad 23 μ crassum, brunneum vel hyalinum introrsum, pilis septatis, 65-350 μ × 4-5.5 μ vestitis. Asci 65-88 × 13-17.5 μ, elliptici vel oblongi, unitunicati, ad apicem cum poro amyloideo, paraphysati. Ascosporae 17.5-21(-25.5) × 5-6.5 μ, hyalinae vel viridae, ellipticae vel ovatae, apicis versus uniseptatis, cellula apicalis 6-7.5 μ longa.

Specimen typicum in foliis *Rhododendri lapponici,* prope "Alpine Gardens, Mount Washington, New Hampshire, 19 Aug 1963", a **M. E. Barr** n. **4104a** lectus; in Herb. Univ. Mass. depositum.

Perithecia erumpent to superficial, scattered on lower leaf surface, 270 μ in diameter, 350 μ high, conic with papillate apex, wall of large blackish brown cells, up to 23 μ wide, the outermost layers polygonal and brown, inner layers compressed and hyaline, scattered setae over much of wall and grouped below papillate apex, setae septate, 65-350 μ long, 4-5.5 μ wide, not tapered, tips rounded and pallid, dark brown below. Asci 65-88 × 13-17.5 μ, elliptic or oblong, unitunicate, apex rounded-truncate, base short stipitate, apical annulus refractive in water, amyloid in Melzer's, in deliquescent paraphyses. Ascospores 17.5-21(-25.5) × 5-6.5 μ, greenish hyaline, elliptic to ovate, straight, ends rounded, 1-septate toward upper end, not constricted, upper cell 6-7.5 μ long, contents guttulate, wall smooth, overlapping biseriate in the ascus.

On dead fallen leaves of *Rhododendron lapponicum.*

Material examined. **New Hampshire:** *Barr* 3859c, Alpine Gardens, Mt. Washington, White Mountains Nat. Forest, 9 July 1963; 4104a (type), 4109b, same locality, 19 Aug 1963.

This species deviates from all others in *Pseudomassaria* by the septation of ascospores in the upper rather than lower third. In all other respects, *P. inversa* is typical of the genus and is closest to the species such as *P. erumpens* and *P. oxydendri. P. inversa* cannot be confused with the other species occurring on *Rhododendron* leaves, *P. thistletonia* or *Chaetapiospora rhododendri,* since they are smaller, immersed in the host tissues or only partially erumpent.

This and the following species are members of the family Amphisphaeriaceae in the Xylariales.

Pseudomassaria thistletonia (Cke.) von Arx, Ber. Schweiz. Bot. Gesell. **62:** 355. 1952. Figs. 19-20.

Physalospora thistletonia Cooke, Grevillea **18:** 74. 1890.

Pseudapiospora thistletonia (Cke.) Petrak & Sydow, Ann. Mycol. **27:** 98. 1929.

Perithecia immersed, few in gray or pallid areas in leaf spots, 140-170 μ in diameter, depressed globose, wall thin, 15 μ wide, layers of light brown, compressed cells, blackened around apical pore, pore periphysate, apex glabrous or bearing one to two setae. Asci 42-75 $\times$ 11-15 μ, elliptical, unitunicate, apex and base rounded, apical annulus amyloid, no pulvillus visible, in thin-walled deliquescent paraphyses. Ascospores 15.5-20 $\times$ 5.5-7.5 μ, greenish or yellowish hyaline, elliptic to obovate, tapered to rounded ends or base pointed at times, straight to inequilateral, 1-septate near base, not constricted, basal cell 2-3.5(-4) μ long, contents guttulate, wall thin and smooth, in fresh material surrounded by gelatinous coating 4 μ wide, obliquely biseriate in the ascus.

Epiphyllous in leaf spots formed by *Guignardia rhodorae* (Cke.) B. H. Davis, on *Rhododendron maximum*.

Material examined. **Maryland:** *Cory*, New Germany, 23 Aug 1946 (BPI, as *Venturia rhododendri*). **New Hampshire:** *Barr* 5152, Rhododendron State Park, Fitzwilliam, Cheshire Co., 25 June 1968.

P. thistletonia was described from England and later discussions of the species apparently refer only to the type collection. The specimens cited agree with the descriptions. *Chaetapiospora rhododendri* (Tengwall) von Arx differs in conic, partially erumpent perithecia bearing numerous elongate setae, and narrow ascospores 12-18 $\times$ 3-4.5 μ, *P. thistletonia* is closely related to *P. leucothoës* (Cke.) Petrak & Sydow, and may be distinguished from the latter species by the few setae and by the host plant.

Records of three members of the Pezizales are included. These species appear to be collected infrequently.

Plicaria trachycarpa (Currey) Boud. Soc. Myc. Fr. Bull. **1:** 102. 1885.

Material examined. **Maine:** *Barr* 3732, Bear Brook, T4 R9, Piscataquis Co., 31 Aug 1962.

Pseudombrophila deerrata (Karst.) Seaver, North American Cup-Fungi (Operculates), p. 141. 1928.

Material examined. **Massachusetts:** *Barr* 5141, Conway, Franklin Co., 15 June 1968.

Gregarious to cespitose on overwintered cabbage stalks.

This discomycete was reported from North Dakota and New York by Seaver. The collection cited contained several dozen small pinkish to brown apothecia. The microscopic characters agree with Seaver's (1942) and Dennis's (1968) descriptions, although I found the paraphyses to be somewhat enlarged at the apex and encrusted with brown pigment.

Trichophaea bullata Kanouse, Mycologia **50:** 131. 1958.

Material examined. **Connecticut:** *Barr* 5200, Sharon Audubon Center, Litchfield Co., 27 July 1968. **Massachusetts:** 5058, Conway State Forest, Franklin Co., 29 Aug. 1967.

Apparently *T. bullata* is not uncommon in eastern North America, judging from these recent collections. Like several other species of *Trichophaea*, it has the aspect of a miniature *Humaria hemispherica* (Fr.) Fckl., with whitish hymenium and brown exterior and marginal hairs. The enlarged bases of the hairs provide a ready means of identification of the species.

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